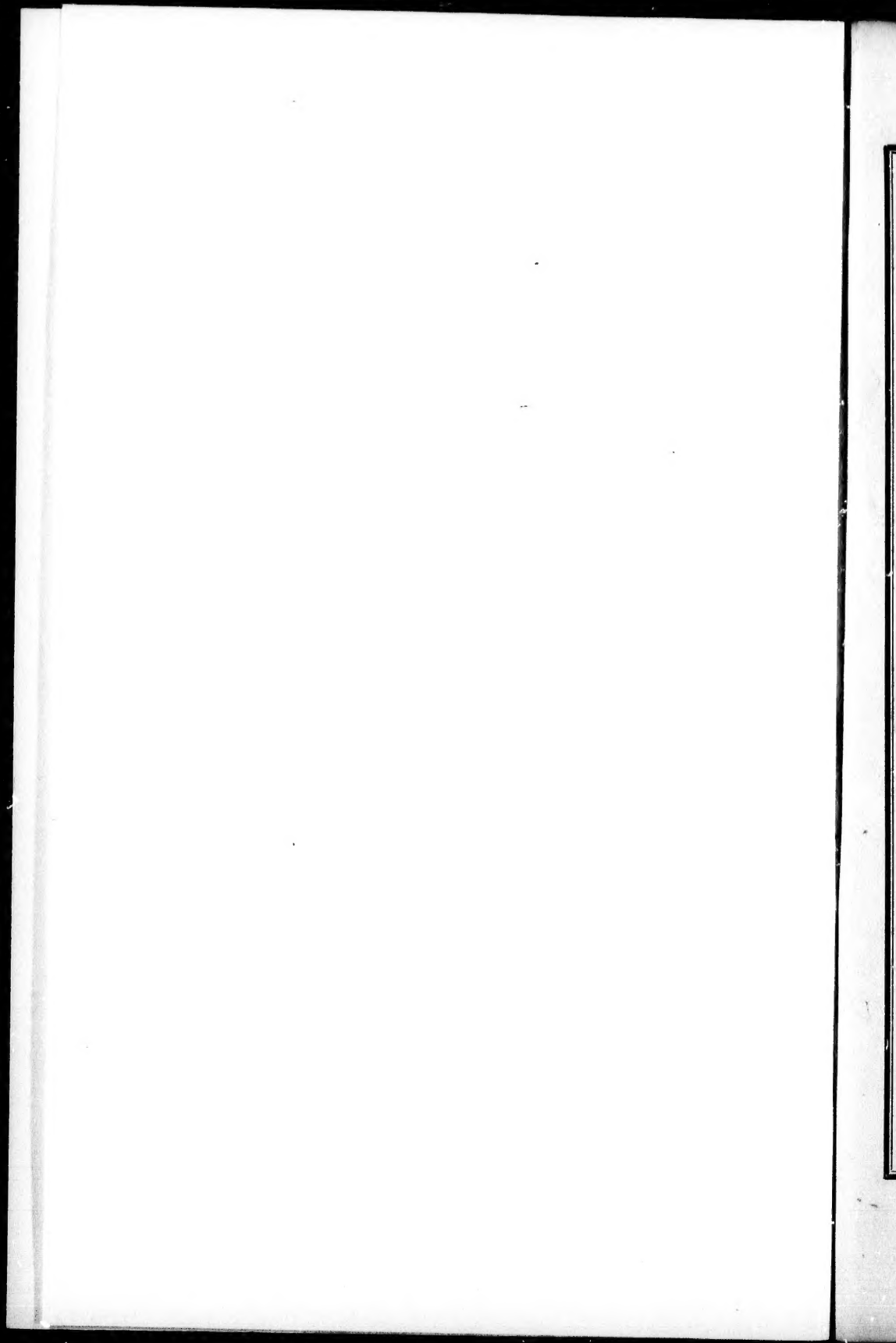




R E P O R T

ON THE

GREAT WESTERN RAILWAY,

CANADA WEST,

TO THE

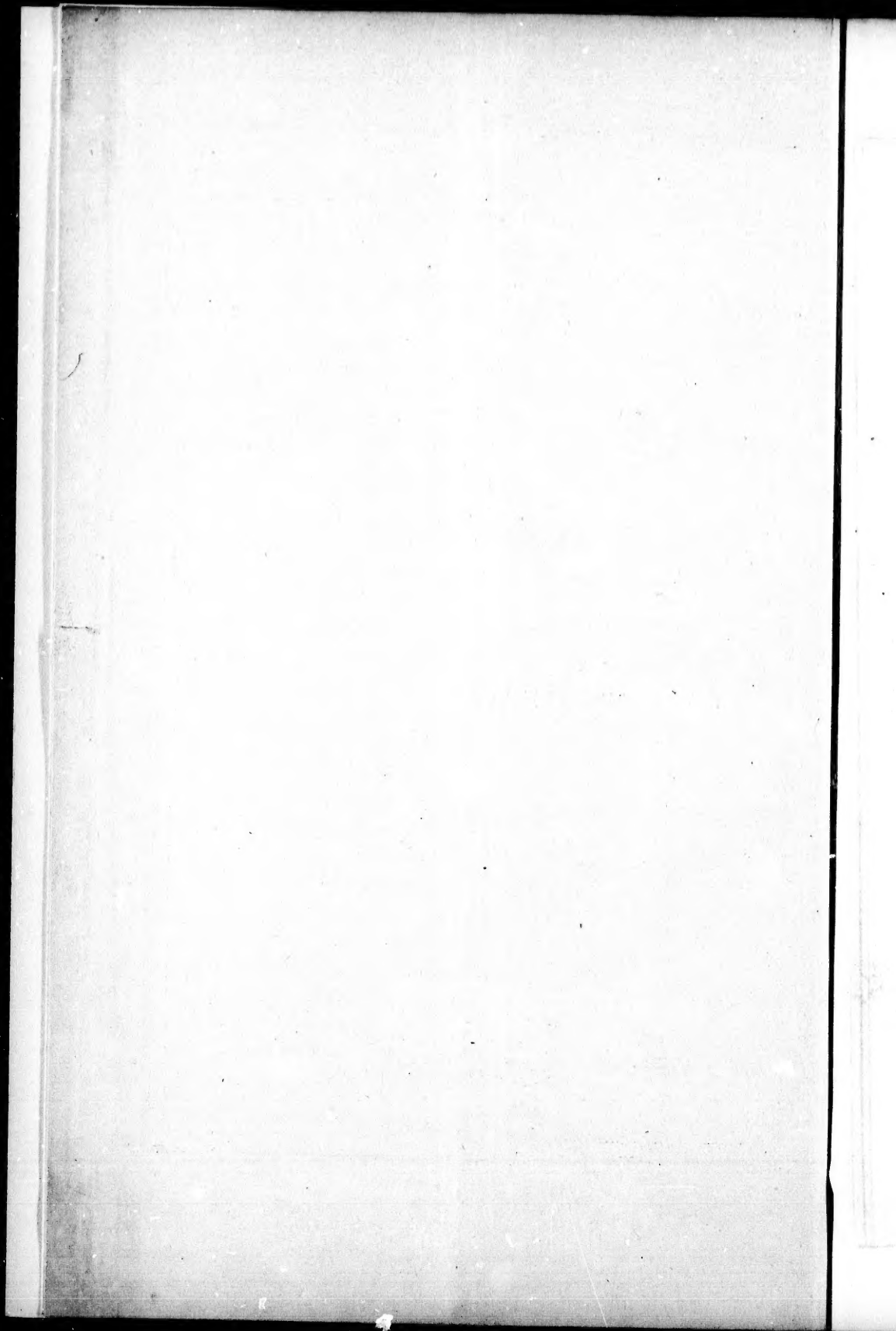
PRESIDENT AND DIRECTORS.

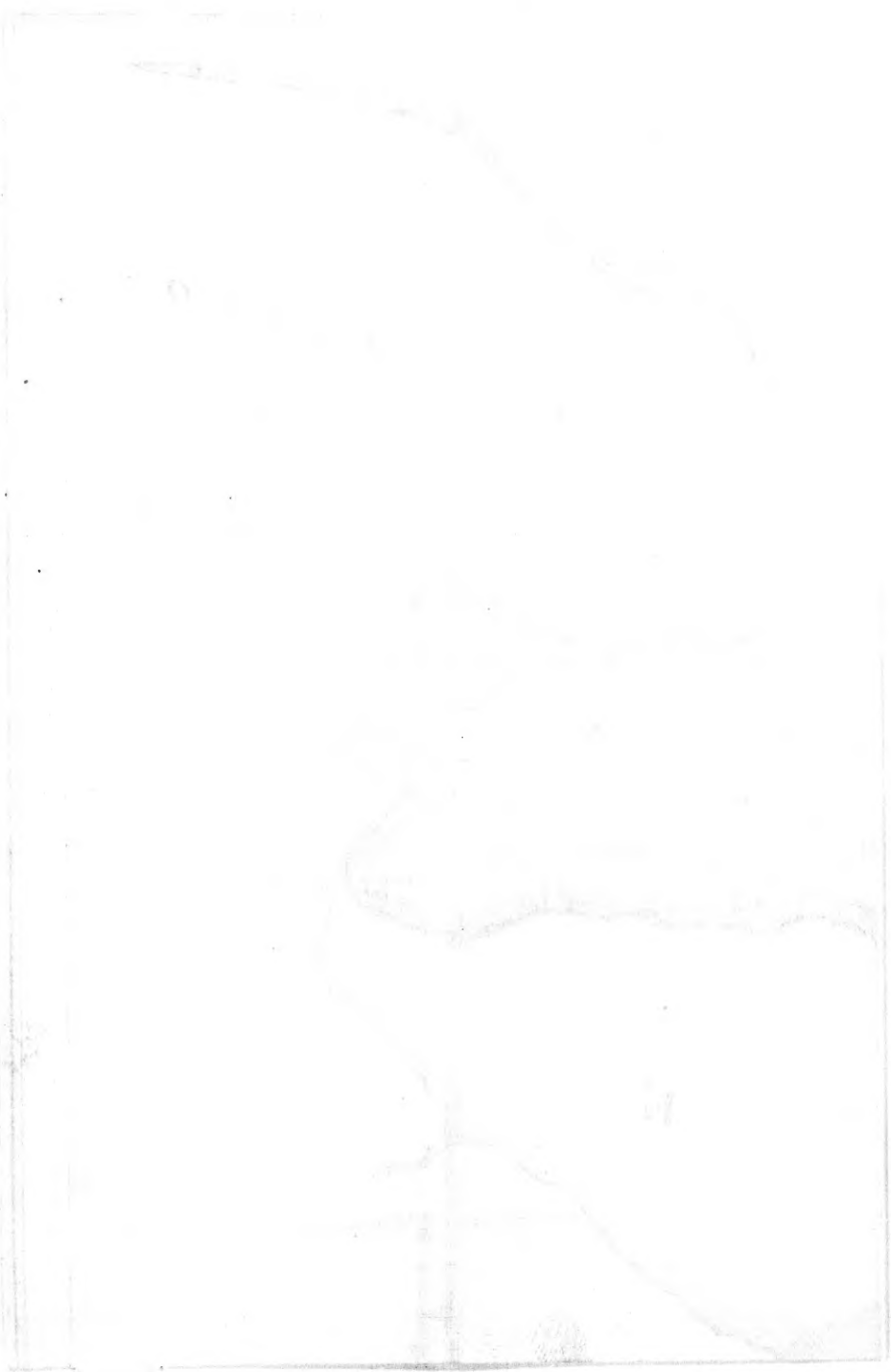
BY

CHARLES B. STUART,

CHIEF ENGINEER.

September 1, 1847.





MAP AND PROFILE of the GREAT WESTERN RAILWAY CANADA WEST

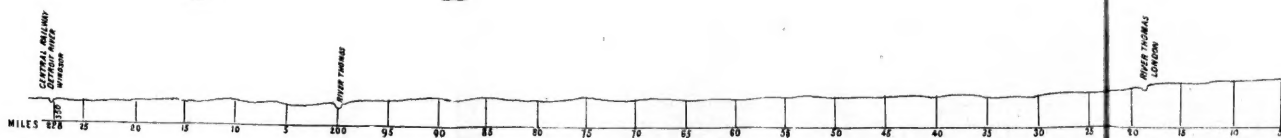
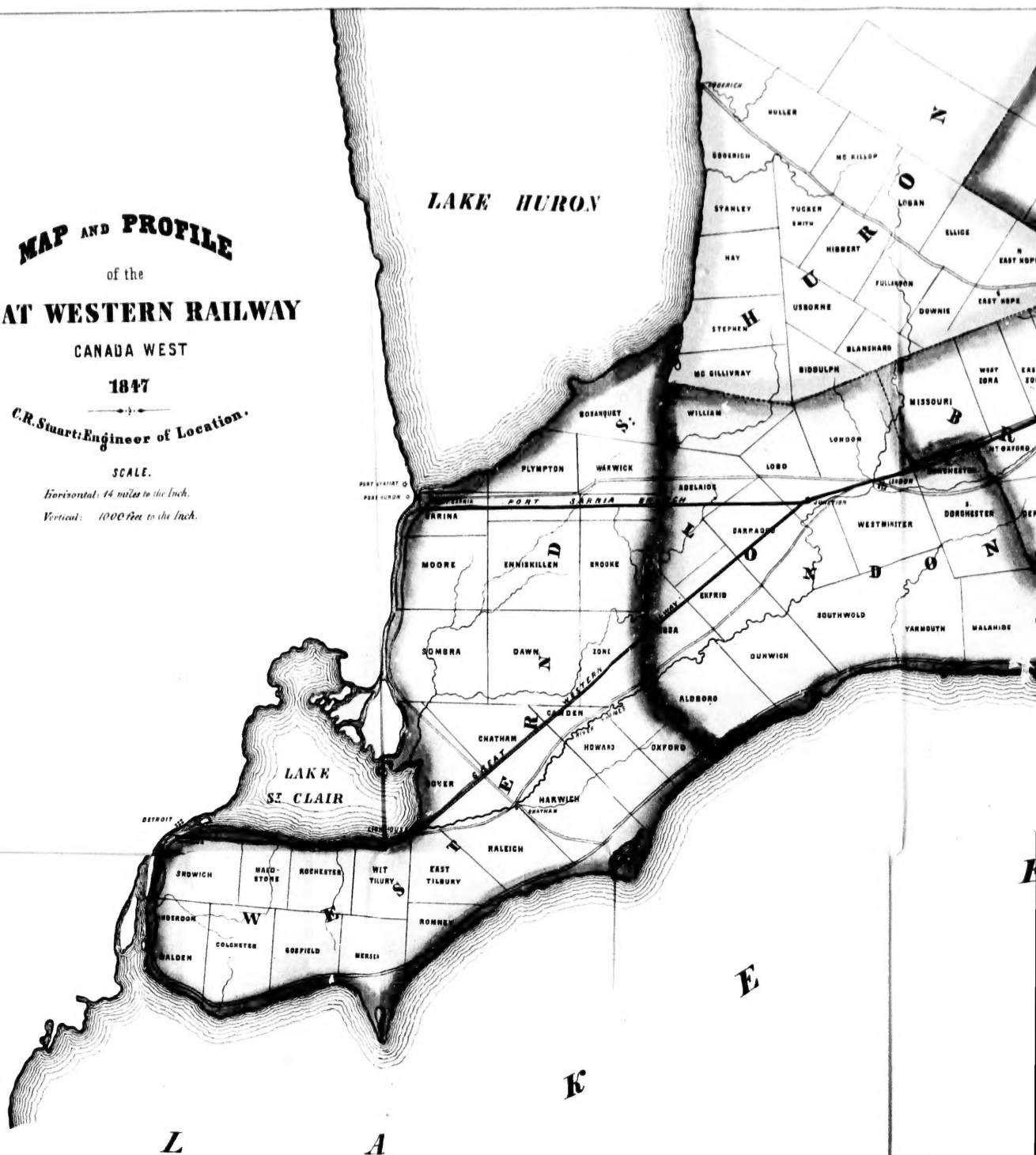
1847

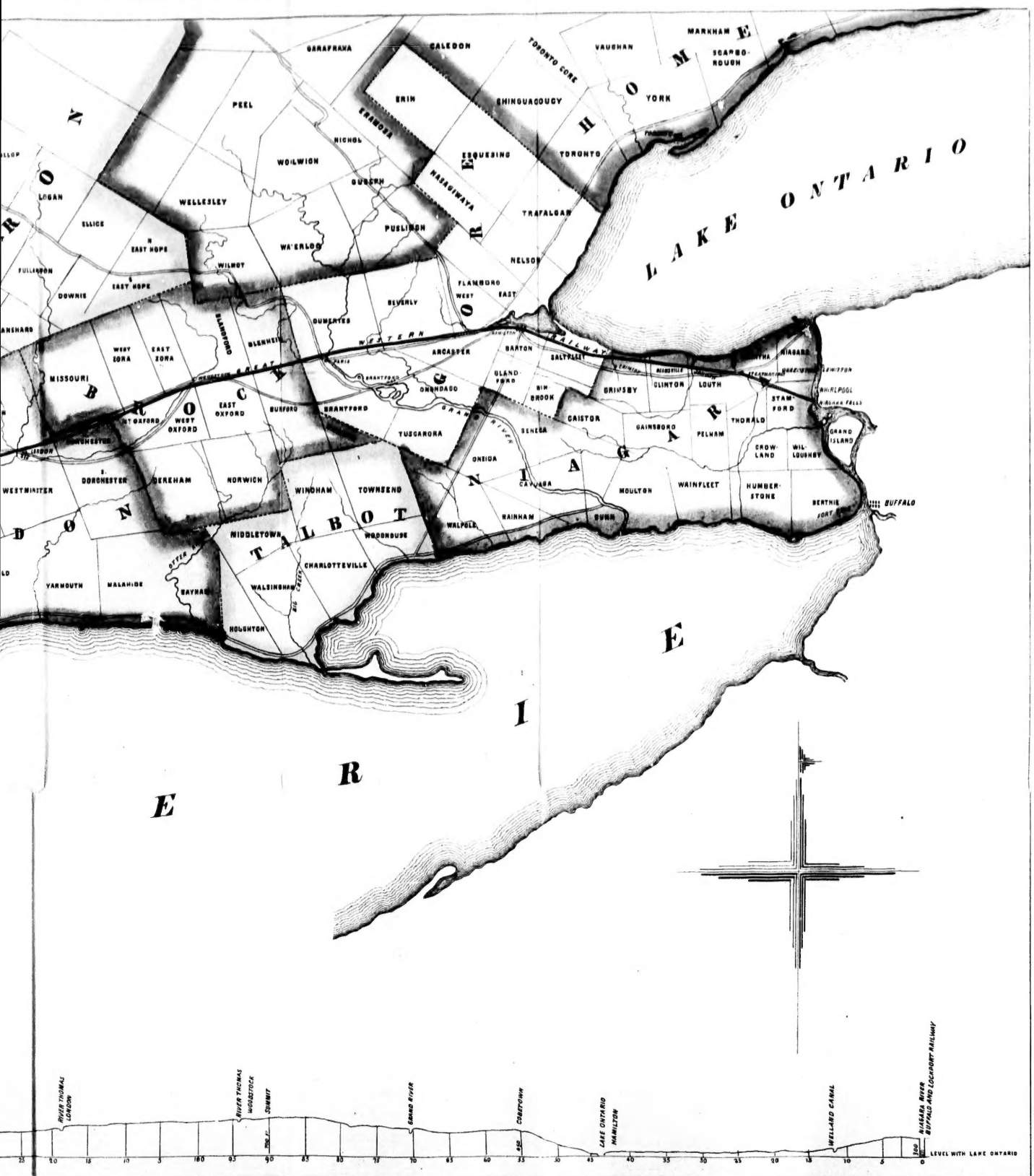
C.R. Stuart: Engineer of Location.

SCALE.

Horizontal: 14 miles to the inch.

Vertical: 1000 feet to the inch.





FUL

R E P O R T
ON THE
G R E A T W E S T E R N R A I L W A Y ,
C A N A D A W E S T ,

TO THE
P R E S I D E N T A N D D I R E C T O R S .

BY
C H A R L E S B . S T U A R T ,
C H I E F E N G I N E E R .

S E P T E M B E R 1 , 1 8 4 7 .

R E P O R T.

TO THE PRESIDENT AND DIRECTORS

OF THE

GREAT WESTERN RAILWAY COMPANY.

GENTLEMEN,—

In submitting to your Board a report on the great work which it has been my duty to locate, I feel compelled to admit my inability to do justice to its unrivalled claims either as a national or commercial enterprise.

The stockholders of this Company control the destiny, and may appropriate the profits, of a line of railway two hundred and twenty-eight miles long, under a liberal charter, with a right to exact toll without legal restriction, to make various important branches—running through a district of country highly favoured by nature, and occupying a site, which, for the attainment of speed, and the future economy of working, is unsurpassed in this country or Europe.

Commencing in the West, at the head of Lake Erie, where daily steamers connect it with all the shores of the great upper lakes, and the fertile lands of the Northwestern States, and a railway now nearly finished, completes the line through the heart of Michigan,—touching in its route, and by its tributaries, at convenient ports on Lakes St. Clair, Huron, and Ontario,—and terminating in the east, on Niagara River, where two railways and a noble canal form

its continuation to New York and Boston; and Lake Ontario and the St. Lawrence furnish an independent channel to Montreal and Quebec—this work seems destined to absorb the traffic of a wider region than often falls to the share of any single enterprise.

All these great tributary trunks, radiating from the eastern extremity of your line, to every prominent point on the New England seaboard, and westwardly almost to the confines of civilization, are now finished, and many of them among the most productive of the works of internal improvement on the continent; while your road concentrating, and in a great measure absorbing, the traffic of all, is the unfinished link in the greatest continuous chain of railway communication in the world.

This immense chain, attracting in its course numerous tributaries, extends from Portland to Boston, thence westwardly to Buffalo and the Falls of Niagara, Detroit, Chicago, and on to the valley of the Mississippi—all the links of which, over a space of seven hundred miles eastwardly, *are finished*, and to the west, nearly one hundred and fifty miles are in operation, and the remaining portion under contract, or on the point of commencement.

And such is the fortunate position of your improvement, that it must form an essential part of another great, though more northern line, commencing at the head, and extending along the Canadian shores, of Lake Ontario, through Toronto and Kingston, and thence on the borders of the St. Lawrence River to Quebec and Halifax; with branch lines reaching out from Oswego to Syracuse, from Cape Vincent to Rome, from Ogdensburgh to Boston, and from Montreal to Portland; portions of each of which are now in progress of construction.

It is not professional skill that has placed the location of your railway on the precise ground that will enable it to control the trade and travel of such a vast portion of the Canadas and the prosperous American States, east and west of its termini. It owes

its value and all these incomparable advantages, to the physical formation, and great geographical divisions of the country.

The direct line of travel from the Atlantic coast of the New England States, to the Mississippi, has been controlled by that distribution of hills and valleys, which formerly ruled the location of the Erie Canal, and conveyed that work due west through the central and richest portions of New York—in a region where great cities have since grown up, and the highest grade of national prosperity has been already approached.

This line of trade and travel is brought to the Niagara frontier, a little south of the western end of Lake Ontario, and a little north of the eastern end of Lake Erie, where Nature seems to have provided for its further progress by bringing the opposite cliffs so near together, that it is practicable there, and there only, to pass over all the waters discharged by the cataract of Niagara, by a single arch.

This westward line cannot be deflected to the south, for Lake Erie lies in the way; and it cannot diverge to the north, for Lakes Ontario and Huron intervene in that direction. It must pass between the Lakes, below the Falls, and along the succession of valleys and level plains which are found in the same parallel, and pursuing the same direction, in West Canada. It cannot deviate from this course until it again encounters the narrow channel that connects the northern lakes with Lake Erie, and that separates Canada from Michigan.

After passing this channel, the same succession of level plains is continued into the fertile and almost boundless region known as the VALLEY OF THE MISSISSIPPI,—that immense field which is now absorbing the surplus population of the kingdoms of Europe, and increasing in influence and wealth with a rapidity that has hitherto been without a parallel in the history of the world.

It is this work—connecting with these inexhaustible feeders, and hereafter to furnish the means of intercourse between the States which are east, and the States and Territories west of Lake Erie—

that it has been my duty first to explore, and subsequently to establish, by extensive and accurate surveys. It is a work running through the western peninsula of Canada, which depends for its support (as will be hereafter exhibited in greater detail):

1st. On the trade and travel of the St. Lawrence and Lake Ontario, brought from the east by numerous steamers, to the mouth of the Niagara River, and to the city of Hamilton, at the head of the Lake:

2d. On that of the State of New York, brought by the Erie Canal to the foot of Lake Erie, and Niagara River near the Falls:

3d. On that brought by existing Railways, from the cities of New York and Boston, and the other ports of the New England States, through the centre of New York to Buffalo and Niagara Falls, destined for Michigan and the Northwestern States:

4th. On the traffic and travel brought by steamboats from Lakes Michigan, Superior and Huron, to the western termini of your road:

5th. On the trade and travel of the States of Michigan, Illinois, and the Mississippi valley, brought to the same point by the Michigan Central Railway, soon to be completed to Lake Michigan opposite Chicago.

These are the great contributors to the support of your work—the lines already in activity which diverge from its extremities towards the east and west—quite independent of the wealth and resources of the immediate district traversed by the improvement itself—by far the most populous and fertile portions of Canada West—which this line *must control* without rival, or the probability of future rivalry.

Ample surveys, which have been extended over every route, offering any pretension to authorize its exploration, have led to the conclusion that there is no appropriate ground on which to place a competitor on either side of that which has been recommended for your adoption.

The "Pelham Heights" and deep ravines cutting through the Queenstown Ridge, prohibit a location on the table-lands south of Hamilton, to reach Niagara Falls,—an idea once seriously entertained, but finally dispelled by the examinations recently completed.

The result of the extensive surveys which I have conducted, with explanatory charts and profiles and estimates in detail, have already been submitted to your Board in my report as Engineer of Location. I have therefore now only to exhibit the characteristics of the line, which, on the authority of these surveys, I have recommended for the definite location of the Great Western Railway, and those evidences of its future success which, in my view demand its construction.

LINE OF LOCATION.

The annexed Map exhibits the line of location, from the site of the proposed Suspension Bridge over the Niagara River, to Windsor, opposite the City of Detroit, crossing the Niagara, Gore, Brock, London and Western Districts of Canada West, and passing through the City of Hamilton and Town of London, agreeably to the provisions of the Charter. It exhibits also, the branch to Port Sarnia, at the foot of Lake Huron.

In the location of the work, careful surveys have been made of the country between the Niagara and Western Frontiers, embracing nearly fifteen hundred miles of instrumental examination, and resulting in reducing the length, and improving the gradients and curvatures of former surveys in a remarkable degree; a saving of thirteen miles having been effected in the aggregate distance, and the maximum grade, previously established at eighty feet, having been reduced to forty-five feet per mile.

On the whole distance of 228 miles, over 217 miles is perfectly straight, and the length of the located line, differs less than four

miles, from an *air line* drawn between the same points. (See note A.)

I know of no case in this country or elsewhere, comparable with this, and it is doubtful whether another location of the same extent can be found on the Continent, so well adapted to the attainment of high velocity, and great economy of transportation.

GRADIENTS.

On a long line of Railway, forming a link in an extended chain of communication, where great speed and punctuality are essential, easy gradients are of the highest importance.

A reference to the annexed map and profile shows that there is but one summit between the waters that flow into Lake Ontario, and those flowing into the Thames, Detroit, and St. Clair Rivers, and that the approach to this dividing ridge is through valleys which afford long and gentle slopes for reaching its summit.

The belt of country extending from the Hudson to the Mississippi, through the centre of New York, Canada West, and Michigan, is the most even and uniform that is to be found in any parallel between the western waters and the Atlantic coast.

This entire distance of nearly one thousand miles, may be traversed along the valleys of rivers, over extended plains, or on the shores of lakes, without interruption from any considerable range of hills.

The gradients of the line will compare favourably with those of any railway of the same length in Europe or America. Approaching from the west, the summit, three hundred and sixty feet above the western terminus, is reached by grades of twenty feet per mile: going from the east, the maximum grade is forty-five feet per mile, and the whole length of this grade is found in a space of twelve miles. (See note B.)

The maximum grade is considerably below that of all the railways in the United States, designed as great thoroughfares between the "West" and the seaboard; and much below many of those on the line between Albany and Buffalo, a district of country remarkable for the evenness of its surface.

To sum up the general results briefly, it will be seen by reference to the tabular statements, that the line of location presents the remarkable feature of having *ninety-five per cent.* of the whole distance in tangent lines, and two-thirds of the remaining *five per cent.*, on curves of which the radii vary from 5,730 feet to 11,560 feet: while 183 miles is either entirely level, or exhibits inclinations of less than five feet per mile, and 54 miles presents slopes of less than 20 feet per mile.

There is no grade on the Port Sarnia branch exceeding 10 feet per mile.

RIGHT OF WAY.

The right of way has been gratuitously released for a distance of nearly one hundred and eighty-two miles, embracing *two thousand four hundred and sixty-four acres* of land, exclusive of ground given for "depots."

From the liberal spirit of the charter, which allows benefits to offset damages, and from the great interest manifested by the landholders generally throughout the entire line, in favour of the work, it is anticipated that most of the remaining portion will also be obtained without expense. The item of land damages, therefore, has not been included in the estimates of the cost of the work.

DEPOT GROUNDS AND BUILDINGS.

Suitable grounds for passenger and freight depots, have been donated to the Company, in nearly all the important towns and

villages on the line, and also at both of the Western termini of the railway, at Windsor and Port Sarnia, amounting in the aggregate to over two hundred acres. In all instances adequate provision has been made in procuring sites for stations to cover the present, and probable future business, of the country.

The plans and estimates for the various depot buildings and necessary shops, have been prepared with a view to the erection of substantial and durable structures of stone or brick, sufficiently extensive to accommodate the anticipated trade and travel for several years after the completion of the work.

WHARVES.

The grounds given the Company for the construction of wharves and docks, to accommodate the business of the lakes, are ample, presenting a front of nearly one mile on the waters of Burlington Bay at the city of Hamilton, of one-third of a mile on the Detroit River at Windsor, and of about the same extent on the St. Clair River at Sarnia.

The estimates of cost include permanent wharves at Hamilton, two thousand feet in length, at Windsor (opposite the eastern terminus of the Michigan Central Railway) of one thousand feet, and at Port Sarnia of five hundred feet.

PLAN OF CONSTRUCTION.

The estimates are made for a single track, with turnouts at proper intervals.

To provide for a thorough drainage, the cuts are estimated for twenty-four feet, with side ditches five feet wide. The embank-

ments are fourteen feet in width on top, and proportionally wider, where they exceed twenty-five feet in height.

The road-bed is to be covered with a ballast of coarse gravel or broken stone, two feet in thickness, on which white oak ties, six by twelve inches, and eight feet long, are bedded, at intervals of thirty inches from centre to centre.

On these ties is spiked an iron rail, of seventy pounds to the yard on the Central Division, and sixty pounds to the yard on the Eastern and Western Divisions, and the Sarnia branch. These rails are firmly secured at the joints, by cast-iron chairs of twenty-five pounds weight.

The culverts, viaducts, and bridge abutments, are intended to be of permanent and durable masonry. The grade line through all the towns and villages on the route, and at all the public roads and farm crossings, has been established, so as to allow the travel to pass over the Railway by bridges, or under the track, by culverts,—an arrangement necessary to remove the danger of collision on a work intended for frequent trains at high velocity. The estimates provide for a substantial fence five feet high, free from bars or gates, on both sides of the track.

ESTIMATED COST.

In making the estimate of cost, great care has been taken to ascertain with accuracy the quantities of earth and rock to be removed or procured for the formation of the road-bed, and the quality of the materials to be excavated.

The principal streams have been sounded for the foundation of the culverts, viaducts and bridges, and the quantity of masonry in the different structures has been calculated from special plans made for each locality.

The prices adopted have been derived from the actual cost of

works of similar character in the United States, but to which has been added a liberal per-centage for incidental expenses, and interest on the instalments during the construction of the work.

The soil throughout the whole distance from the Niagara River to London is generally composed of sand and gravel, well adapted to the formation of a substantial and durable road-bed.

West of London the soil is more mixed with clay, but gravel ridges are still found at convenient intervals to furnish an abundance of dry material for ballast.

The cost of stone and timber has been carefully ascertained at the different points where heavy masonry and bridges are required, and the utmost confidence is felt, that the quantities and prices are sufficiently liberal to meet every probable contingency.

The line touches several points where vessels can deliver the iron, and thus save much expense in its distribution.

It may be noticed that railroad iron, delivered in Canada, costs *five pounds less per ton*, than the same quality and pattern, manufactured in, or imported into, the United States, making a difference in favour of the Great Western Railway of over £500 per mile, or an aggregate of about £125,000, or \$500,000 for the whole work.

ESTIMATE.

The cost of the work, by the detailed estimates now submitted, is as follows, viz.:

EASTERN DIVISION.

FROM NIAGARA RIVER TO HAMILTON CITY.

42·10 miles in length.

Graduation as per estimate, &c.	-	-	\$570,048	or	£142,512
Superstructure, including branches,	-	-	395,640	"	98,910
Total amount,	-	-	965,688	"	241,422
Add 6 per cent. interest for six months,	-	-	28,970	"	7,245
Total cost,	-	-	\$994,658	"	£248,667
Equal to \$23,682 or £5,920 per mile.					

CENTRAL DIVISION.

FROM HAMILTON CITY TO LONDON.

75·84 miles in length.

Graduation, &c., as per estimate,	-	\$1,328,800	or	£332,400
Superstructure, including branches,	-	722,000	"	180,500
Total amount,	-	2,050,800	"	512,700
Add 8 months' interest, at 6 per cent.	-	82,286	"	20,571
Total cost,	-	\$2,133,086	"	£533,271
Equal to \$27,067 or £6,767 per mile.				

WESTERN DIVISION.

FROM LONDON TO WINDSOR.

109.95 miles in length.

Graduation, &c., as per estimate,	-	\$602,965	or	£150,741
Superstructure, including branches,	-	1,092,500	"	273,125
Total amount,	- - - -	1,695,465	"	423,866
Add 6 months' interest, 6 per cent,	-	50,864	"	12,716
Total cost,	- - - -	\$1,746,329	"	£436,582
Equal to \$15,875, or £3,969 per mile.				

PORT SARNIA BRANCH.

49.85 miles in length.

Graduation, &c., as per estimates,	- -	\$233,752	or	£58,438
Superstructure, including branches,	- -	412,500	"	103,125
Total amount,	- - - -	646,252	"	161,563
Add 6 per cent. interest, for 6 months	-	19,387	"	4,847
Total cost,	- - - -	\$665,639	"	£166,410
Equal to \$13,312 or £3,328 per mile.				

SUMMARY.

DIVISION.	Length in miles.	ESTIMATED COST.			Total Halifax Currency.
		Graduation.	Superstructure.	Interest.	
Eastern,	42.10	£142,512	£98,910	£7,245	£248,667
Central,	75.84	332,200	180,500	20,571	533,271
Western,	109.95	150,741	273,125	12,716	456,582
Main track, . . .	227.89	625,453	552,535	40,532	1,238,520
Port Sarnia Branch,	49.85	58,431	103,125	4,847	166,410
Total,	277.74	683,884	655,660	45,379	1,404,930

From the foregoing summary it appears that the cost of the main line from Niagara River to Windsor will be £1,238,520, or \$4,954,080, and including the Port Sarnia branch, £1,404,930, or \$5,619,720.

Should it be deemed expedient to complete the Eastern and Western Divisions as speedily as possible, and use the Plank and McAdam Road, between London and Hamilton, during the progress of the grading of the Central Division, the cost, as estimated, would be as follows:—

EASTERN DIVISION,	42.10 miles.	-	-	£248,667
WESTERN DIVISION,	109.95 "	-	-	456,582
Total,	152.05 miles.			£705,249

It thus appears that two-thirds of the main line can be completed for 56 per cent. of the total cost of the whole, and, from the favourable character of the work on the Eastern and Western Divisions,

It cost to work the road and pay for repairs during the same time, . . .	\$3,473 40
Net earnings in less than 9 months, . . .	\$125,826 51

The receipts of this railway for the last three years in the month of May, were,—

1845.	1846.	1847.
\$15,324 55	\$32,819 85	\$41,011 76

showing an increase of nearly *two hundred per cent. in two years.*

The number of passengers carried over that road, in 1846, as furnished to me by the Superintendent, J. W. Brookes, Esq., was 63,228; while in 1841 the number was less than 25,000. The net earnings are now 15 per cent., of which, however, but 7 per cent. is divided, the balance going to new construction account. This Company are now making docks of great extent, and a freight depot, 800 feet in length, and 100 feet in width, at Detroit, for the accommodation of produce from the West.

The importance of these results will be appreciated by those who are conversant with the position and character of this work, which can only be regarded as a future tributary of your own, since it is the *direct* western continuation of your line, which will throw off this arm towards the Mississippi, while at the same time maintaining its connexion with the Upper Lakes by means of steamboats from Detroit and Port Sarnia. This central road is an extension already formed, and waiting only for the completion of the Great Western Railway, to pour its treasures through that channel while another road, already chartered and surveyed, is projected from Port Huron to the mouth of Grand River—crossing the most fertile and highly cultivated portion of the State, abounding in water power and mineral wealth, and terminating on the shore of Lake Michigan directly opposite Milwaukee, the most flourishing town

in the State of Wisconsin, which, at no distant day, will be an equally important tributary to the Port Sarnia branch.

There are Railways likewise projected and authorized by law, intended to connect the Central Railway with Chicago, Galena, and St. Louis, and there can be little doubt that ere many years these links will also be completed.

THE PONTIAC RAILWAY, terminating at Detroit, has been for some years in operation, and well-filled passenger trains run each way daily, and during the season of navigation large quantities of grain and flour are brought over the road, from the interior of the state.

There has been a charter granted to construct a ship canal (one mile in length) around the Sault de St. Marie, of a size sufficient for the largest vessels and steamers on the lakes to pass. Its completion will open to commerce the wealth of Lake Superior, the largest of all the lakes in the great chain, and induce to the speedy settlement of the lands on its borders, and render its mines and fisheries tributary to the northern branches of your road.

THE ILLINOIS CANAL connecting the Illinois River with Lake Michigan, at Chicago, will be ready for navigation next season. From its intersection with the Illinois River, that stream is navigable for large steamers, down to its junction with the Mississippi. The canal and the river will take in their sweep almost the entire business of the State of Illinois, and connect with the Mississippi at a point where they will command most of the trade of Iowa. This navigation is nearly certain also to attract much of the business of St. Louis, and the Upper Mississippi valley.

THE EASTERN TERMINUS of your road, is at Niagara River, (where it intersects the Erie and Ontario Railway, now in operation) and connects with three several railways on the opposite shore by

the suspension bridge, of which the construction is to be immediately commenced.

From this point there is now, as already stated, (on the American side,) a continuous railway, leading by the way of Buffalo, to Boston and the other Eastern ports; another to Lewiston, on the navigable part of the Niagara River, where steamers ascend from Lake Ontario; a third, completed to Lockport on the Erie Canal, and shortly to be extended in a direct line to the city of Rochester, and there connect with railways to Albany and Boston. On the opening of this important link, the distance from Albany to Niagara Falls will be reduced *twenty-two miles*, which will make it the same as the present distance from Albany to Buffalo.

A railway is also projected from Rochester City to Syracuse, along the line of the Erie Canal, on a route some 28 miles shorter than the existing line of railway between the same points.

A railway is also under contract from Syracuse to Oswego, on Lake Ontario, to be completed in the summer of 1848; and another line has been surveyed, to connect the railway at Rochester with the New York and Erie Railway at Corning, on the Chemung River,—the construction of which will direct the travel passing from New York City over the latter road, and destined to Detroit, or west of that point, to Rochester and Niagara Falls, and thence westward by your line. By taking this route through West Canada, passengers for Detroit will *save one hundred and twenty-six miles*, even after the completion of the New York and Erie Railway, and the entire line of projected road along the southern shores of Lake Erie.

SOURCES OF BUSINESS.

It has already been seen, that the termini of this railway east and west are converging points where the population of New York, and the six New England States, moving *West*, and that of

the States of Michigan, Illinois, Wisconsin, Iowa, portions of Indiana, and Missouri, the regions of the Upper Mississippi, and Lakes Huron and Superior, moving *East*, will be drawn upon its track: that at Hamilton, it takes the whole sweep of Lake Ontario, and the St. Lawrence, and will of necessity extend its attractive influence as far as the branches now in progress from Montreal to Portland, and Lake Champlain.

We have here a population of about *two and a half millions in the West*, composed chiefly of emigrants from the East,—whither nearly all their commercial business tends,—and over *six millions in the East*, which will find your road their most convenient route.

The intercourse between two and a half millions in the West, and six millions in the East,—numbers multiplying now more rapidly than ever,—a population bound together by political and commercial relations, and the ties of consanguinity, could scarcely fail to furnish a rich reward to the enterprise of those who can command their transportation.

But without relying upon conclusions drawn from such general facts, a prudent caution would suggest that we should look to actual results on the finished works that compose a large proportion of the great chain, of which your work will hereafter be the centre, and other statistics known to be authentic.

It has been shown that 63,228 passengers were carried over the Michigan Central Railway, yet incomplete, in 1846. Add to this number, the passengers *passing* Detroit in steamboats, in the same year, which, as reported by J. L. Barton, Esq., steamboat agent, was 260,000, and it appears that no less than 323,228 passengers were conveyed east and west, in that year.

Now, when it is observed that the transit from Detroit to Buffalo, over the Great Western, and the Buffalo and Niagara Falls Railways,—a distance of 250 miles,—can be made with comfort and safety, in *nine hours*; while from 24 to 36 hours are ordinarily consumed (in the most favourable weather) in the passage by

steamboats, over a lake on which the navigation is deemed, by competent judges, more dangerous than that of the Atlantic, (see note C,) the conclusion cannot be resisted, that the greater part of this travel will be commanded by your line, even in the summer season: while, in winter, it will of necessity monopolize the whole intercourse between Canada and New York, and the northwestern states and territories.

It will be seen by reference to note D (page 36,) that the line of railways from Niagara Falls to the Hudson River, conveyed in 1846, more than 90,000 through passengers, and yielded an average profit of ten per cent. on their aggregate cost.

Leaving out the two short railways east of Schenectady, which, in addition to their great cost, are rival lines, the profits on the residue was nearly twelve per cent.

The Great Western Railway is to be the extension of those which now terminate at Buffalo. Its length is 228 miles. If we now take 228 miles on the line from Buffalo to the east, we find a net revenue in 1846, of \$555,000, and a dividend of nearly twelve per cent., actually earned upon that distance.

The value of these roads, however,—flattering as it appears,—cannot be regarded as a just criterion for the Great Western Railway, which, while presenting a much more favourable location, smaller grades, and easier curvature, will concentrate the travel of these very lines at Niagara Falls, together with all that which will be brought by steamboats through Lake Ontario from Oswego, and that which will shortly pass from Portland by the way of Montreal; and from Vermont, New Hampshire, and Lake Champlain, by the way of Ogdensburgh, upon the eastern end of your work.

And in addition to these objections to the application of the results obtained on the western portions of the railways from Albany to Buffalo, it is to be observed that the conveying of freight on this line is confined to the one-half of the year,—the most expensive for

its transportation,—and the exaction of canal tolls, even for this privilege. And, further, the Albany and Buffalo Road has for a competitor the packet and line boats on the Erie Enlargement, *which carry more passengers than the railway*; while, at Syracuse, large numbers are drawn towards Lake Ontario at Oswego, from which port there is a daily line of large steamers to the Niagara River and Hamilton.

The passengers which avoid the railway from Syracuse to Buffalo, by taking the Erie Canal, will find the Great Western Railway the cheapest and quickest route to the West; and those which diverge from it towards Oswego, will also be drawn upon your work at the Falls or Hamilton.

FREIGHT FROM THE WEST.

On turning to the products of the West now seeking the markets in the East, we again find evidences of present wealth and future increase, equally gratifying and satisfactory.

In 1835 the states west of Lake Erie still imported their provisions, which were principally conveyed to them through the Erie Canal.

In 1846 the *exports from the West* which passed through Buffalo, were:—

Flour,	-	-	-	1,280,897 barrels.
Wheat,	-	-	-	3,611,224 bushels.
Corn, -	-	-	-	1,179,689 bushels.
Beef and pork,	-	-	-	99,398 barrels.
Equal to 290,000 tons.				

This is independent of the traffic of the Welland Canal, through which, during the same year, passed from the West:—

Flour,	-	-	-	273,284 barrels.
Wheat,	-	-	-	3,172,969 bushels.
Corn,	-	-	-	461,933 bushels.
Beef and pork,	-	-	-	34,211 barrels.

The entire amount of flour, wheat, and other grain exported by the Western States, through Lake Erie, in 1846, for Canada and the eastern markets, reduced to bushels, would exceed *fifteen million of bushels*, or 450,000 tons.

Of these exports, 781,141 barrels of flour, and 744,379 bushels of wheat, were sent from the State of Michigan, and more than half of this quantity was shipped from the port of Detroit, while a large proportion of the balance was carried from ports west of Detroit, directly past the two western termini of your road.

It is almost impossible to arrive at the entire amount of the commerce of the western or upper lakes, but sufficient authentic facts have been ascertained to show that it is already very great, and is now increasing in an unprecedented ratio.—(See note E.)

The value of the exports from the port of Detroit, going *east*, in 1846, was \$2,495,336, and of the exports from Buffalo, going *west*, the same year, was \$23,199,665, and amounted to 153,761 tons.

WAY TRAFFIC.

The sources of *through traffic*, only, have yet been considered.

The completion of the Great Western Railway will entirely change the channel of trade and commerce, open new sources of business, and add greatly to the wealth and population of the immediate districts through which it passes, comprising more than 850,000 acres of well-cultivated land, well adapted to the raising of wheat and maize, which are now extensively grown. Inexhaus-

tible beds of gypsum and lime, are found along the line of the road, and can be profitably transported to the West for a market.

The districts actually traversed by this work, contain a present population of 220,000, which for some years has been increasing at the rate of ten per cent. per annum.

At one end of the line, is the flourishing city of Detroit, with 15,000 inhabitants; at the opposite end, the great attraction of Niagara Falls, drawing its thousands of annual visitors,—at the head of Lake Ontario, the city of Hamilton, with a population of 8,000 souls, increasing at the rate of 100 per cent. in five years; while the whole line is dotted with flourishing towns, more frequent and populous than those on the railways from Rochester to Buffalo.

Water power abounds along the line, which it will be seen, by note (F) has been already greatly improved, and will of course be further developed by the completion of this road.

Plank and McAdam roads have been constructed by the "Board of Works," to the extent of several hundred miles, converging generally towards the line adopted for this improvement, and over which large quantities of produce and lumber are drawn from great distances, to reach a market.

It will be observed by referring to note (G) that the exports from the port of Hamilton and through the Welland Canal amount to a large quantity, and are greatly on the increase. From the port of Hamilton there was exported,

In 1845,	119,388	barrels of flour,		
In 1846,	155,298	"	"	
And to July, 1847,	136,090	"	"	
Total in 2½ years,	410,776	"	"	

COST OF TRANSPORTATION.

The great bulk of the freight which will pass over your road will consist of the products of the West seeking the eastern markets.

The whole length of line from Detroit to the port of Hamilton being 185 miles, freight trains may make the transit at the speed dictated by true economy,—not exceeding eight miles an hour,—in 24 hours. They may make their trips with the produce of the upper Lakes, from Port Sarnia to Lake Ontario, (133 miles) at the same speed, in eighteen hours.

Now, the distance from this latter point—Port Sarnia—to Lake Ontario near Hamilton, by the way of Lake Erie and the Welland Canal, is over 430 miles, or more than three times as great, and consumes an average time by *steam propellers*, of from four to five days, and double that time by sailing craft.

The cost of freight on flour carried from Port Sarnia to the mouth of the Welland Canal, for the last two seasons, has not been less than 25 cents per barrel.

But it is well known that flour has been carried from Albany to Boston, 200 miles, over the Western Road, where there are grades of 83 feet per mile, for 25 and 30 cents per barrel. And on this road, over such grades, with the Hudson River for a competitor, no less than 231,920 barrels were carried *through* to Boston, and 163,919 barrels to other stations on the line, in 1846, or nearly 25 per cent. more than was carried in 1845. (See note H.)

Can it then be doubted, that when the flour which is now flowing through the Welland Canal in quantities almost sufficient to block up that channel, can be carried between the same points in little over one-fourth the distance, and in the tenth part of the time, required by the water route, and over grades of but 20 feet per mile,

that the railway will have an ample share? And if flour is carried 200 miles on the Western Railway, over 83 feet grades, for 30 cents, may it not be taken with great profit, 133 miles, over grades of 20 feet, at a much smaller price?

In fact, an analysis of the grades and curvatures of your railway, and those of the road alluded to, will show, that a locomotive which will convey 100 tons from Port Sarnia or Detroit, to Lake Ontario, can draw but 43 tons from Albany to Boston, at the same speed; and therefore, if 30 cents will meet the bare cost of conveyance on that work, 15 cents from Sarnia or 20 cents from Detroit, will pay a good profit on yours.

Let it here be kept in view that next season all the ship canals around the rapids of the St. Lawrence River, will be completed, so as to permit steamers and ships of over 400 tons burden, to clear at Hamilton for any foreign port.

I would now invite your attention to the map accompanying this report, exhibiting your work with its branches and connexions, and ask by what route the trade of Michigan and all the northern Lakes, can pass to the Ocean, as direct, convenient or cheap, as from Detroit or Sarnia by your road to the shipping port of Hamilton, and thence, without breaking bulk, by Lake Ontario and the St. Lawrence to European markets.

And in connexion with this route, I ask you to look at the vast shipments of grain through the Welland and Erie Canals, from a country, which, ten years ago, imported a great part of the food of its inhabitants, and then judge—not what it will be ten years hence, when the hundred thousand annual emigrants now filling up the fertile regions of the “FAR WEST,” shall have been changed from consumers to producers, and have begun to send off *their* surplus products—but what will *now* be the profits of your road if you obtain but a small portion even of the *present trade*.

Eighty thousand emigrants have already this year reached Montreal, in vessels from Europe, and in consequence of a small link in

the chain of ship canals around the rapids being incomplete, (which will be finished in a few months,) they are there transhipped, and ascend the St. Lawrence in steamboats and propellers.

Next season these vessels may proceed directly to Hamilton, and there discharge their passengers, and load with flour for Europe, while the emigrants can be carried westward in the return freight trains, at a very low price.

There can, under the circumstances, be no question of the ability of your road, to command an abundant share of through freight. There can, in my estimation, be as little doubt of its successful competition even for that portion of the long travel for which economy is a more important element than comfort or expedition.

The through passengers who seek comfort or speed, will of course take the Railways to Niagara Falls, and thence to Detroit, on your line, and avoid the loss of time and dangers of the passage over Lake Erie.

Those whose choice is controlled by economy of money and not by time, will decide at Syracuse between the railways to Buffalo, and the steamers to Detroit, on the one hand, and the railway to Oswego, steamers to Hamilton and your road to Detroit, on the other.

By the former route they will pass over

179 miles of railway, and

362 miles of lake navigation;

By the latter, they will pass over,

220 miles of railway, and

160 miles of lake navigation;

making a difference against your route of 41 miles of railway, and in its favour of 202 miles of water conveyance, or a saving in the aggregate of 161 miles of distance, or 44 per cent on the shorter route. Can it then be doubted that the main line of travel, also, will set through the *shortest* channel? (See note I.)

OF THE PROBABLE REVENUE.

How shall we estimate the probable revenue of a work like the Great Western Railway, to which there is nothing analogous in the history of the internal improvements on this continent?

It bears no resemblance to the railways in the States, which usually run from a seaport into the interior, and may be compared with similar works, by a comparison of the population and productiveness of the adjacent country.

Yours crosses a peninsula where, at one end, the products and travel of hundreds of thousands of square miles, are compelled by nature to concentrate at a single point, at the head of Lake Erie; and at the opposite extremity, the merchandise and other objects of transportation are forced to converge by numerous natural and artificial channels, to another similar point, the head of Lake Ontario. Here quantities of trade and travel, unequalled elsewhere, when thus concentrated, *must*, during one half of the year, pass over this line,—all other channels being closed by frost,—and during the remainder, choose between the safe, cheap, and direct route of your road, and the dangerous, more expensive, and circuitous passage over Lake Erie.

It will be remembered that the roads, leading from Albany to Niagara Falls, in 1846, earned 10 per cent. on their capital, notwithstanding the restrictions of their charters; while the Michigan Road, on the other end of your line, earned 15 per cent. on its cost.

It will also be remembered, that 260,000 persons last year passed Detroit in steamboats during the season of navigation; and that during the same period, there was exported from ports west of your railway, 3,000,000 barrels of flour, and over 5,000,000 bushels of wheat and corn.

There can be no doubt, then, that there is, and will ever be, abundance of freight and travel to transport, and it has been already shown, I think, that your route offers the greatest economy of time and money.

It seems, therefore, only important to inquire into the capacity of the Great Western Railway, for the accommodation of this vast business.

I have already stated, that there is no ascending grade on the lines from the western termini of the road, to the head of Lake Ontario, exceeding 20 feet per mile. On grades of this inclination, freight engines of the class now generally used, will draw a gross load of 400 tons, or trains containing 250 tons of merchandise, at a speed of six miles per hour.

If such a train were started from each end of the line once a day, they might pass in the centre, and carry 500 tons through daily, which would be equivalent to 182,500 tons annually, or nearly equal to *two millions barrels* of flour. If such a train were started from each end every twelve hours, there would be required but three places of meeting, and the annual transport would be 365,000 tons.

It is not necessary to pursue this subject, for the quantity transported by two such daily lines, would be nearly four times as great as that conveyed by the Western Railway in Massachusetts, in 1846, which, though an unusually costly line, pays fair dividends.

For the transportation of passengers on a road like yours, there can scarcely be a limit to its capacity.

Having endeavoured to exhibit briefly the most prominent sources of business on which your railway is to depend for its support, I do not deem it necessary to enter into any speculative estimate of the quantities which it will command, or the profits which it will yield. But it can be confidently asserted, that there is no process of estimating its business results, based upon the

foregoing facts, or the experience of other works of internal improvement, which will not justify all that need be claimed.

It is not my wish to make extravagant estimates of the future business of your road, or to excite unreasonable hopes of gain.

But it may, however, be useful to ascertain the number of passengers, and the amount of freight it would require at moderate charges to support this railway.

If then, there should be of through passengers of the first class, an average number of 100 each way daily, at 2 cents per mile, and of second class of through passengers, half this number daily, at 1 cent per mile, the yearly receipts would be

\$416,000

If the way passengers should equal 50 per day each way, at $2\frac{1}{2}$ cents a mile (half way) the receipts from that source would be . . .

\$104,000

If the emigrants should equal 200 per day for one half the year, at *one dollar* each from Lake Ontario to Detroit or Port Sarnia, the receipts would amount to . . .

36,500

Should 500,000 barrels of flour only, be carried from Detroit to Hamilton, at 20 cents per barrel, it would add to the receipts . . .

100,000

And if the through and way freight reached only 50,000 tons (or *half* a full train per day) the yearly receipts would be, at 2 cents per ton per mile, . . .

228,000

Say for mails and express, . . .

15,500

And we obtain a total of . . .

\$900,000

Deduct from this amount 38 per cent., the average expense of the railways from Albany to Buffalo last year, (see note D), and we have for expenses . . .

342,000

Leaving a net revenue of . . .

\$558,000

or £130,500, equivalent to *ten per cent.* on the estimated cost of the work, and over nine per cent. on the capital stock of six millions of dollars.

Having exhibited as briefly as possible the sources from which the Great Western Railway is to derive its support, the characteristics of the line of location, and the method of construction recommended, and having estimated with great care and caution the probable cost of the improvement, I now have the satisfaction to report, that the accuracy of my estimates has been fully confirmed by the judgment of experienced and responsible parties, who have contracted for the graduation and masonry of the entire Eastern Division, at prices lower than the estimate, with an agreement to take twenty-five per cent of the sum to which the contract will amount, in the Company's stock.

In accordance with a subsequent resolution of your Board, I have advertised the Western Division, extending from London to Windsor, 110 miles, and the Port Sarnia Branch, 50 miles, to be let on the 1st of October. I doubt not that all this work will be taken on terms equally advantageous and satisfactory.

With the highest confidence in the success of an enterprise which it has been my duty to examine closely, and with full assurance that its achievement will be the signal of a great change in the direction of the trade and travel of the West, of immense importance to this Province, as well as to the adjacent States, I cannot but urge its immediate and vigorous prosecution to completion.

I have the honour to be, gentlemen,

Your obedient servant,

CHARLES B. STUART,

Chief Engineer.

Engineer's Office, Great Western Railway,
Hamilton City, September 1st, 1847.

APPENDIX.

NOTE A.

Table of Distance in miles.

DIVISIONS.	Mail Road.	Railway.	Air Line.
Niagara Falls to Hamilton,	49·50	42·10	41·22
Hamilton to London, - -	85·	75·84	74·20
London to Windsor, - -	115·50	109·95	108·54
Total, - - - - -	250·00	227·80	223·96

Linear Arrangement.

DIVISION.	Tangent in miles.	CURVES IN MILES.				Total length.
		Radius 11460 ft.	Radius 5730 ft.	Radius 2865 ft.	Radius 1910 ft.	
Eastern, - -	39·82		1·87		0·41	42·10
Central, - -	70·94	0·39	1·42	2·52	0·58	75·84
Western, - -	106·38	1·53	2·04			109·95
Sarnia Branch,	47·24	1·59		1·02		49·85
	264·38	3·52	5·33	3·54	0·99	277·74

NOTE B.

Table of Gradients.

DENOMINATION OF GRADE.	NAME OF DIVISION.			Pt. Sarnia Branch.	Total.
	Eastern.	Central.	Western.		
	Miles.	Miles.	Miles.	Miles.	Miles.
Level and under 5 feet per mile, - - - -	21·37	34·83	85·52	41·40	183·12
5 to 10 feet per mile, -	4·15	2·06	8·50	8·45	23·16
10 to 20 feet per mile,	8·55	14·75	6·11		29·41
20 to 30 feet per mile,	8·03	9·75	6·82		24·60
30 to 40 feet per mile,		3·35	3·00		6·35
45 feet maximum west,		11·10			11·10
Total, - - - -	42·10	75·84	109·95	49·85	277·74

NOTE C.

James L. Barton, Esq., of Buffalo, in his Letters on Lake Commerce to the Chairman of the Committee on Commerce in the United States House of Representatives, under date of May 15, 1846, says, "The storms and tempests on the Lakes (Erie, Huron, and Michigan) are as violent as on the Atlantic, and the dangers of navigating them is known and acknowledged by those who have tried both, to be equally as great, if not greater. The boisterous weather last fall was very destructive to lives and vessels, amounting to, as nearly as a careful account can make it, sixty lives lost, thirty-six vessels driven ashore, twenty of which became total wrecks; four foundered with entire loss of crews and cargoes, and producing a loss in the value of property of over two hundred thousand dollars. And it has suffered in losses, within the last five years, more than *four hundred lives*, and destruction and damage to steamboats, vessels, and cargoes, more than *one million of dollars*. Ruinous and destructive as the want of safe harbours is to our commerce, the difficulties are vastly increased from the almost impassable condition of the flats in Lake St. Clair. Here steamboats and vessels are daily compelled, in all weather, to lie fast aground, and shift their passengers, cargoes, and luggage into lighters; exposing life, health, and property to great hazard and then by extraordinary heaving and hauling are enabled to get over. Indeed, so bad has this passage become, that one of the largest steamboats, after lying two or three days on these flats, everything taken from her into lighters, was unable, with the powerful aid of steam, and everything else she could bring into service, to pass over!"

NOTE D.

Tubular Statement of the Length and Cost of the principal Railways in the State of New York, together with their Receipts, Expenses, Net Income, number of Passengers and number of Miles run by trains in 1846, as compiled from the Official returns made to the Secretary of State, January 1, 1847.

NAMES OF RAILWAYS.	Length in Miles.	Total cost in Pounds Cur. ency.	Average cost per Mile in Pounds.	Through Passengers.	Way Passengers.	Miles run by Trains.	Cost of running per mile in Cents.	Receipts in Pounds.	Expenses in Pounds.	Net Revenue in Pounds.	Per cent, per annum, Profit on Cost.	Per cent of Receipts for Expenses.
Mohawk and Hudson	17	£365,288	£21,487	174,653	None.	61,872	66½	£28,464	£10,499	£18,015	4	36½
Schenectada and Troy	20	160,385	8,019	57,793	4,996	53,713	53½	9,195	7,886	1,309	4	85
Utica and Schenectada	78	547,376	7,017	134,663	87,155	167,600	100	107,099	41,955	65,144	12	39
Syracuse and Utica	53	282,232	5,325	103,798	51,481	130,000	75	64,409	24,112	40,297	14½	37½
Auburn and Syracuse	26	168,809	6,493	96,675	9,134	61,660	75	29,759	11,541	18,218	10½	40
Auburn and Rochester	78	466,261	5,980	62,218	80,037	189,245	68½	72,588	27,367	45,001	9½	38
Tonawanda	43½	188,389	4,331	65,359	27,028	70,706	64	35,954	11,296	24,658	13½	31½
Attica and Buffalo	31½	76,767	2,443	77,517	10,116	64,652	52	21,624	8,391	13,233	17½	39½
Buffalo and Niagara Falls	22	51,475	2,385	42,399	7,916	24,500	60	8,488	3,661	4,827	9½	43
	369	2,306,982	6,252	815,575	277,863	823,948	71	377,580	146,272	230,702	10	38½

The above railways are mostly single track, with plate rail, (with the exception of two short ones,) but an iron rail is now being laid on those east of Rochester, which will cost £2,500 or \$10,000 per mile.
 Total length 369 miles. Total cost, £2,306,982 or 9,227,928 dollars.
 Average cost per mile, £6,252 or 25,008 dollars.
 Average profits 10 per cent on the above railways, or 11 9/10ths per cent on the railways from Schenectada to Niagara Fall.
 Average cost per mile of running the trains 71 cents.
 Average per cent of receipts for expense, 38½.

NOTE E.

COMMERCE OF THE LAKES.

The unprecedented increase of the commerce of the Upper Lakes, during the past twenty years, caused by the increase of population and opening of new avenues of communication with the fertile West, has exceeded the most sanguine estimates, and points with unerring certainty to its continued progress.

The construction of the important canal around the Sault de St. Mary, a channel of one mile, through which must flow the vast mineral wealth of the Lake Superior region, will give additional value to the already great and increasing Northwestern trade. The growth of the West is steadily and rapidly onward; and with this growth the commerce of the Lakes, and the travel between the East and West must keep pace. The following statements of the increase of the Upper Lake commerce can be relied upon, as they are made up at the custom-houses, at the several ports of entry, from undoubted authority.

The first sail-craft upon Lake Erie was the sloop Detroit of 70 tons, in 1796, and up to the declaration of war in 1812, the total number of vessels of *all* descriptions afloat upon Lake Erie was *twelve*. The first year after the war (1816) the aggregate tonnage of sail-craft upon the Upper Lakes was 2180, embracing about forty sail (two small schooners, only, being over 100 tons burden.) The number of arrivals and departures at the port of Buffalo that season, amounted to only *eighty*—in 1818, when the first steamer was built, they reached 100. In 1846, the number of arrivals and departures at the same port was *seven thousand seven hundred and fourteen*, forming an aggregate of *one million eight hundred and twenty-five thousand nine hundred and fourteen tons*.

On the 1st of July, 1847, there were the following number and description of vessels owned and running on the Lakes above Niagara Falls, as near as could be ascertained by the most careful and extensive research.

Number and Names.	Aggregate tons.	Average tons.
81 Steamers,	35,835	442
31 Propellers,	10,295	332
63 Brigs,	14,589	231
315 Schooners,	47,738	152
490 Total,	108,457	221

Average cost per mile, \$6,252 or 25,008 dollars.
 Average profits 10 per cent on the above railways, or 11 9.10ths per cent on the railways from Schenectady to Niagara Fall.
 Average cost per mile of running the trains 71 cents.
 Average per cent of receipts for expense, 38½.

There was an increase of tonnage of about thirty-five per cent. in the last eighteen months. The total cost of the above vessels is estimated at six millions two hundred and forty thousand dollars, or one million five hundred and sixty thousand pounds—of which amount over two millions of dollars, or fifty thousand pounds has been expended since January, 1846, in the construction of new vessels, and the repairing and enlarging old ones.

The following comparative statements of the exports from the Upper Lakes, will mark the rapid change that has taken place within a few years in the West.

ARTICLES.	1835.	1845.	1846.
Flour, barrels,	86,233	717,466	1,280,897
Provisions, barrels,	6,562	68,100	99,398
Wheat, bushels,	98,071	1,354,990	3,611,224
Corn, "	14,579	33,069	1,179,689

In addition to the above, the following articles passed through the Welland Canal to Lake Ontario, from the West, and from the Canadian ports on Lake Erie.

ARTICLES.	1845.	1846.	To July 1, 1847.
Flour, barrels,	207,555	273,284	211,897
Provisions, barrels,	13,962	34,211	16,608
Wheat, bushels,	1,891,627	3,172,969	1,658,093
Corn, "	22,092	461,933	445,100
Boards, feet,	11,584,096	14,855,065	13,848,921

PORT OF CHICAGO,

ILLINOIS.

	WHEAT EXPORTED.	FLOUR EXPORTED.
1845	956,860 bushels,	13,750 barrels.
1846	1,459,599 "	23,045 "
Increase,	502,739 "	9,295 "

The flour already shipped up to the 31st of July, 1847, exceeds that for the whole year last season.

PORT OF MILWAUKIE,

WISCONSIN.

	WHEAT EXPORTED.	FLOUR EXPORTED.
1845	95,500 bushels.	7,500 barrels.
1846	213,448 "	15,756 "

The flourishing towns of Racine, Southport and Little Fort, on the western shore of Lake Michigan between Milwaukee and Chicago, will add their share towards swelling this immense amount of exports, and will compare favourably with Milwaukee, lying, as they do, directly in front of the best wheat-growing country in Wisconsin.

The arrivals and departures at this port, Milwaukee, for 1846, were :

	ARRIVED.	DEPARTED.	TOTAL.
Steamers, - -	352	348	700
Propellers, - -	111	109	220
Brigs, - - -	95	94	189
Schooners, - -	837	835	1672
	1395	1386	2781

To show how rapidly the West is being settled and improved, we have only to note the change that has taken place in Wisconsin alone in a few years.

In 1830 the population was	.	.	.	.	.	3,245
" 1836 " " "	.	.	.	.	.	11,686
" 1840 " " "	.	.	.	.	.	30,945
" 1842 " " "	.	.	.	.	.	46,678
" 1846 " " "	.	.	.	.	.	245,228
" 1847 in July estimated at	.	.	.	.	.	360,000

Up to 1840 Wisconsin imported their supplies of every kind, including provisions. In 1846 they fed themselves, supplied an army of over 100,000 new emigrants, and of their surplus remaining they exported through the Lakes between three and four millions of dollars in value, mostly in agricultural products.

The lead and shot, made in this State in 1846, and which principally sought a market, via the Mississippi, is known to have been very large.

NOTE F.

THE GREAT WESTERN RAILWAY

Passes through the Niagara, Gore, Brock, London and Western Districts, and contiguous to the Wellington, Huron and Talbot. The following abstracts from the assessment roll show the improvements in these districts for the year 1848.

NAME OF DISTRICT.	Population.	Acres of Land Cultivated.	Houses.	Mills.		Merchant Shops.	Cattle.				Amount of Ratable Property.
				Grist.	Saw.		Horses.	Oxen.	Cows.	Young Cattle.	
Niagara - - - - -	49,883	181,334	4,700	67	103	262	12,620	8,802	16,220	7,200	£661,130
Gore - - - - -	50,632	298,234	5,409	106	172	236	10,996	6,356	18,932	6,300	947,413
Brock - - - - -	30,000	101,100	1,203	25	65	57	4,006	3,760	8,949	3,239	313,587
London - - - - -	52,170	168,485	2,619	59	92	83	6,558	6,019	13,979	5,806	551,781
Western - - - - -	40,700	102,700	1,362	28	34	46	4,800	3,940	7,640	4,280	381,354
Wellington - - - - -	27,037	133,375	1,277	57	62	67	3,693	5,843	10,162	4,765	367,617
Huron - - - - -	14,983	20,355	187	12	17	14	452	1,709	2,519	1,713	91,120
Talbot - - - - -	15,693	80,134	1,419	24	82	37	3,469	2,284	6,870	1,590	251,156
Total,	291,098	1,085,727	19,176	378	627	802	46,594	38,753	85,271	34,893	£3,565,188

NOTE G.

PORT OF HAMILTON.

The following table is obtained from the Collector of Customs for the Port of Hamilton, and comprises a few of the principal articles of export, for the years 1845, 1846, and a part of the year 1847.

ARTICLES.		YEAR.	YEAR.	FROM JAN. 1ST TO
		1845.	1846.	AUG. 1ST 1847.
Flour,	Barrels,	119,388	155,298	136,090
Pork, beef, and spirits, . .	"	4,614	8,993	5,793
Butter and lard, . . .	Kegs and barrels,	271	688	994
Fish,	Barrels,	560	657	22
Wheat, Indian corn, barley, and rye,	Bushels,	5,693	13,583	981
Hewn timber,	Feet,	224,500	154,000	98,123
Boards,	"	135,152	16,750	486,400
Staves,	"	314,000	111,137	99,500

WELLAND CANAL.

Statement of some of the principal articles of property passed through the Welland Canal, during the season of 1845, 1846, and of 1847 from the commencement of navigation until the first of July.

ARTICLES.	1845.	1846.	1847, (to July 1).
Wheat, Bushels,	1,891,627	3,172,969	1,658,093
Corn, "	22,092	461,933	445,000
Beef and pork, . . . Barrels,	13,962	34,211	16,608
Flour, "	207,555	273,284	211,897
Ashes, "	3,062	4,677	1,141
Salt, "	219,722	237,811	51,391

ARTICLES.	1845.	1846.	1847, (to July 1).
Boards, Feet,	11,584,096	14,855,065	3,848,921
Hewn timber, "	1,200,824	1,852,563	1,007,082
Staves,	5,119,876	2,591,511	452,500
Shingles,	299,500	389,500	
Passengers,	3,092	3,743	

TONNAGE.	1845.	1846.	1847, (to July 1).
Number of schooners,	2,041	2,335	1,034
" steamboats and propellers, . .	422	400	188
" scows,	1,147	1,170	476
" rafts,	104	120	39
Tonnage	312,571	385,969	181,226

A portion of the above returns, comprise Imports and Exports from the Gore District, by the Grand River, and from ports on Lake Erie, Canada side.

NOTE H.

WESTERN RAILWAY, MASSACHUSETTS.

NUMBER OF BARRELS OF FLOUR TRANSPORTED FROM ALBANY AND TROY.

Year.	To Boston.	To other stations.	Total number.
1845	181,796	146,386	328,183
1846	231,920	163,919	396,839

Number of tons transported in eleven months of 1846.

Through from Boston to Albany, westward,	8,358
All other tonnage,	40,251
Total going west,	48,609

Through from Albany to Boston, eastward,	36,403
All other tonnage,	81,382
Total going east,	117,785
Total number of tons moved,	166,394
Equivalent number of tons carried one mile,	15,748,223
Equivalent number of tons carried over the whole road,	100,950

Number of miles run by locomotives in eleven months of 1846.

For passenger trains,	215,369
For freight trains,	313,259
For gravel trains, etc.,	45,328
Total number of miles run,	573,956

The income of the road for eleven months to November 30, 1846, has been,

Passengers,	\$389,861 42
Freight,	459,365 18
Mails, express, etc.,	29,191 29
Total income,	\$878,417 87

Expenses for the same period have been as follows :—for

Road repairs,	\$80,293 25
Engine repairs,	48,909 25
Car repairs,	40,544 06
Building, etc.,	16,195 02
Transportation expenses,	202,524 45
General expenses,	24,213 77
	\$412,679 80
Net income,	465,738 09

The amount of earnings for December, 1846, have been \$76,000, which, added to the receipts for eleven months, will make the gross receipts of 1846, \$954,417 89, and an increase over the year 1845, of \$140,937 89.

NOTE I.

When the railways on the most direct routes from Chicago to Boston and New York shall all be completed and furnished with heavy iron rails, the traveller can pass from the former to New York in thirty-four hours, and in thirty-six hours to Boston, including all necessary detentions.

		MILES.	CONVEYANCE.	HOURS.
From Chicago	to Detroit,	285	Day train	10
" Detroit	" Niagara Falls,	228	Night "	8
" Niagara Falls	" Rochester,	75	" "	2½
" Rochester	" Albany,	250	Day "	8½
" Albany	" New York,	150	" "	5
" Chicago	" New York,	987		34
" Albany	" Boston, extra,	52		2
To Boston from Chicago		1039	Miles in	36

On the completion of the Great Western and the Syracuse and Oswego Railways, the passage may be made from New York to Detroit, via Oswego and Hamilton, in thirty-six hours; from New York to Chicago in forty-eight hours; from New York to the Mississippi River in sixty hours; and all the way to New Orleans in seven days, as follows:

		MILES.	CONVEYANCE.	HOURS.
From New York	to Albany,	150	Night steamer	8
" Albany	" Oswego,	168	Day railway	8
" Oswego	" Hamilton,	160	Night steamer	12
" Hamilton	" Detroit,	185	Day railway,	7
" Detroit	" New Buffalo,	240	" "	10
" New Buffalo	" Chicago,	45	Night steamer	3
Total		948		48

From Chicago to Galena in 10 hours, and by steamboat to New Orleans in five days.

STATEMENT SHOWING THE INCREASE OF BUSINESS ON
VARIOUS RAILWAYS IN THE UNITED STATES.

NAME OF RAILWAY.	Year.	Amount of Net Revenue.	Year.	Amount of Net Revenue	Increase.
Boston and Lowell, . . .	1836	£22,450	1845	£44,256	£21,806
Boston and Worcester, . .	1842	45,174	1845	59,431	14,257
Western,	1842	61,517	1845	110,715	49,198
Eastern,	1842	37,532	1845	58,327	20,795
Boston and Providence, . .	1842	30,911	1845	49,457	18,546
Boston and Maine, . . .	1842	19,150	1845	33,245	14,091
Nashua and Lowell, . . .	1842	9,903	1845	18,668	8,765
New Bedford and Taunton,	1842	8,105	1845	12,209	4,104
Utica and Schenectada, . .	1837	48,198	1845	65,879	17,681
Utica and Syracuse, . . .	1843	23,568	1846	40,297	16,629
Auburn and Rochester, . .	1843	22,073	1846	45,901	22,928
Camden and Amboy, . . .	1833	45,250	1839	106,750	61,500
Columbia and Philadelphia,	1835	57,338	1840	112,317	54,979

CLIMATE OF CANADA WEST, AND THE HIGHEST AND LOWEST TEMPERATURE, NUMBER OF WET AND SNOWY DAYS, FROM THE YEAR 1840 TO 1846, INCLUSIVE.

The following Mean is taken from the Government Meteorological Observations made at Toronto.

MEAN HEIGHT OF THERMOMETER.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.	Yearly Mean.
1840	18°	29°	33°	43°	54°	60°	66°	65°	54°	45°	36°	25°	44·1°
1841	25	23	26	39	51	66	65	65	51	42	35	30	44·3
1842	28	28	36	43	50	56	66	65	56	45	33	26	44·3
1843	29	16	22	41	50	59	66	65	59	42	33	31	42·8
1844	21	28	32	48	54	60	61	66	53	44	35	29	44·7
1845	27	25	36	42	50	61	68	67	56	46	36.	22	44·79
1846	26	25	33	44	56	64	68	68	63	45	41	28	46·44

WEATHER TABLE KEPT AT TORONTO,

SHOWING THE AMOUNT OF RAIN, SNOW, AND FAIR WEATHER DURING EACH YEAR,
FROM 1840 TO 1846, INCLUSIVE.

Year.	Number of Wet days.	Number of Snowy days.	Perfectly fair.	Toronto Bay frozen over.	Ice gone from Toronto Bay.
1840	97	56	213	6th December.	28th March.
1841	80	46	239	18th December.	12th April.
1842	89	55	221	Not noted.	17th March.
1843	83	73	209	13th December, but broke up again.	23d April.
1844	106	41	219	18th December.	Not noted.
1845	97	47	221	3d December.	Not noted.
1846	103	43	219	14th December.	8th April.

NOTE.—Any day on which rain falls, whether more or less, is noted as a wet day.
The same observation applies to snow.

Severe cold seldom lasts more than three days successively during the winter; the weather then moderates for a few days, again succeeded by a sharp frost. It is never so severe in Canada West as to put a stop to out of door employment.

Greatest depth of snow three feet, seldom over two feet, the average depth about one foot.

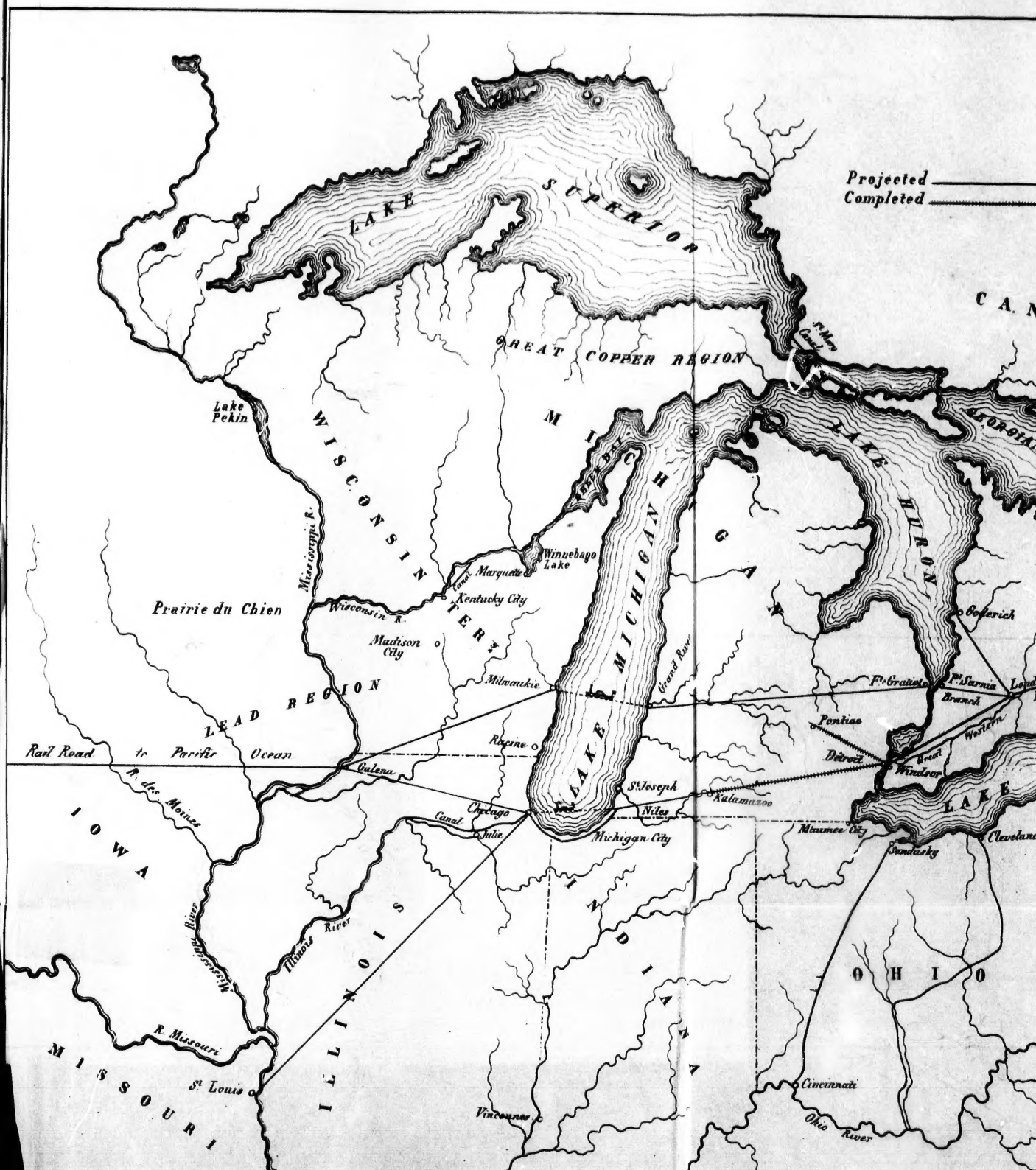
MAP

WATER

CHARTERED

WATER





Projected _____
Completed - - - - -

L. Beard del.

Projected _____
Completed _____

MAP
of the Route of the
GREAT WESTERN RAILWAY
SHEWING ITS CONNECTION WITH OTHER PUBLIC WORKS
Projected and completed

